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Dynamic effects and information quantifiers of statistical memory of Meg's signals at photosensitive epilepsy

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Abstract

The time series analysis of magnetoencephalographic (MEG) signals is very important both for basic brain research and for medical diagnosis and treatment. Here we discuss the crucial role of statistical memory effects (ME) in human brain functioning with photosensitive epilepsy (PSE). We study two independent statistical memory quantifiers that reflect the dynamical characteristics of neuromagnetic brain responses on a flickering stimulus of different colored combinations from a group of control subjects, which are contrasted with those from a patient with PSE. We analyze the frequency dependence of two memory measures for the neuromagnetic signals. The strong memory and the accompanying transition to a regular and robust regime of the signals' chaotic behavior in the separate areas are characteristic for a patient with PSE. This particularly interesting observation most likely identifies the regions of the protective mechanism in a human organism against occurrence of PSE.

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Keywords

Human brain, Information quantifiers, Photosensitive epilepsy, Statistical memory, Stochastic processes